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CIA-RDP85T00875R00160002[redacted]

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DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

The Effects of the Bombing in Laos Since 1 November 1968

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ER IM 69-4
January 1969

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Copy No. 17

CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
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INTELLIGENCE MEMORANDUM

The Effects of the Bombing in Laos Since 1 November 1968

Summary

Increased US air attacks in Laos since the bombing halt in North Vietnam have increased the disruption of enemy traffic flows and the destruction of trucks and other logistics targets; however, the attacks have been unable to prevent the movement of supplies required by enemy forces in Laos and in South Vietnam.

The bombing halt over North Vietnam and improved weather permitted more attack sorties to be flown against targets in Laos during November -- almost 13,500 -- than in any previous month. Almost as many sorties were flown in November as were flown during the entire fourth quarter of 1967. The November effort included some 660 B-52 sorties, about two and one-half times the number flown in October. About 90 percent of the attack sorties were flown in the Laotian Panhandle (the Steel Tiger area) against roads, fords, bridges, trucks, truck parks, and antiaircraft artillery sites on the main supply routes from North Vietnam.

It is still too early to evaluate fully the effectiveness of the newly accelerated US air effort against Laos. The major preliminary findings are as follows:

Note: This memorandum was produced solely by CIA. It was prepared by the Office of Economic Research and was coordinated with the Office of Current Intelligence and the Director's Special Assistant for Vietnamese Affairs.

1. The heavy attacks against Ban Laboy Ford on Route 912 have complicated but not stopped the movement of supplies into Laos over this route. Fewer trucks probably entered the Panhandle on this route in 1968 than during comparable months of 1967. Trucks continue to move through the area, however, and enemy counter-measures -- such as additional anti-aircraft artillery and construction battalions moving into the area -- indicate the North Vietnamese intend to contest the interdiction effort.

2. Even with the reduced traffic moving into Laos over Route 912, the volume of traffic moving into and within Laos for this time of year is about normal. In recent weeks, pilot sightings, sensor reports, and roadwatch teams all testify to a steady step-up in traffic. The ability of the trucks to continue to move strongly suggests that air attacks have complicated but have in no way crippled the enemy's supply movements through Laos.

3. The increased number of sorties being flown over Laos resulted in 390 trucks reportedly destroyed and damaged in the Laotian Panhandle during November compared with 193 trucks in October. In November 1967, however, far fewer sorties destroyed and damaged 826 trucks. The smaller number of trucks being destroyed and damaged in November compared with 1967 results from two factors: (1) the monsoon ended earlier in 1967 so that there were more trucks on the road in November 1967, and (2) the enemy undoubtedly learned from experiences of 1967 that it is necessary to disperse truck movements and to take better advantage of the hours of darkness and bad flying weather.

4. More damage is being done to fixed targets -- truck parks, road segments, antiaircraft artillery sites, and supply areas -- in the Panhandle than ever before. However, the increased damage to fixed targets has not had a serious impact on the enemy's logistical capabilities within the Panhandle. The targets available for attack in Laos are exceptionally rudimentary. Bridges, fords, depots, and truck parks are widely dispersed, difficult to locate, and hard to destroy.

5. Combat losses have been low over Laos. During 1968 -- through November -- only 32 fixed-wing aircraft were downed in Laos, and the combat loss rate has been about 0.5 aircraft per 1,000 sorties. During approximately the same period the comparable loss rate over North Vietnam was 1.1 aircraft per 1,000 sorties. Since 1 November the Communists have strengthened their antiaircraft artillery defenses in the Laotian Panhandle, and with the bombing halted in North Vietnam there is every reason to expect that in the months ahead the enemy will continue to move more antiaircraft artillery weapons into Laos.

Increase in Air Operations

1. During November, 13,460 attack sorties* were flown over Laos, significantly more than the total flown in any previous month and almost as many as were flown in the entire fourth quarter of 1967. Since the halt of the bombing of North Vietnam, the Air Force and Navy have diverted to Laos almost all of the attack sorties that had formerly been flown against targets in North Vietnam while maintaining the previous level of attacks against the enemy in South Vietnam.** US Navy aircraft, which flew an average of only 700 attack sorties a month against targets in Laos during the first ten months of 1968, flew about 2,350 sorties against these targets in November. About 660 of the sorties were by B-52's, two and one-half times the number in October.

2. Air operations over Laos since the bombing halt are still divided between two major operational areas: Barrel Roll, extending along the North Vietnamese border in northern Laos, and Steel Tiger, extending south from Route 8 to the Cambodian border and containing most of the Laos Panhandle. The Barrel Roll and Steel Tiger areas are further subdivided into alphabetically designated sectors, Alpha through Golf (see Figure 1). Air operations in the Barrel Roll area are primarily targeted to support military operations against the Pathet Lao and the North Vietnamese forces in northern Laos. The major purpose of the attack against targets in

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* *Although there are discrepancies between CIA-DIA and Seventh Air Force figures on total sorties flown in southern Laos -- probably because of differences in interpreting sortie data -- the CIA-DIA agreed figures in this memorandum represent an acceptable order of magnitude.*

** *For a statistical comparison of the air war over Laos and North Vietnam in the period 1965-October 1968, see Table 1.*

the Steel Tiger area is to interdict the flow of supplies to enemy forces in Laos and South Vietnam.

3. About 90 percent of all attack sorties over Laos since the bombing halt have been flown against targets in the Steel Tiger area, principally against Echo and Foxtrot sectors. Since 1 November, an increased share of the attack sorties, about 55 percent, have been flown against targets in the Echo sector, which includes the main entry routes into the Laotian Panhandle. Earlier, in the first ten months of 1968, about one-third of Steel Tiger sorties were flown in each of the Echo and Foxtrot sectors.

4. Most attack sorties over Laos continued to be flown during daylight hours. Since at least the beginning of 1967, the US Air Force has flown an average ratio of two day sorties to each night sortie. Day sorties strike predominantly stationary targets such as road segments, bridges, and truck parks; night sorties are flown mostly against moving targets. The great predominance of truck destruction is achieved at night.

5. A long-planned dry season air offensive against major truck parks and chokepoints in the Laotian Panhandle, codenamed "Commando Hunt," was initiated in mid-November (see Figure 2).* This campaign relies heavily on sensor data from the Igloo White program and supporting FAC aircraft to direct strikes against truck parks as well as moving vehicles in the northern half of the Steel Tiger area.

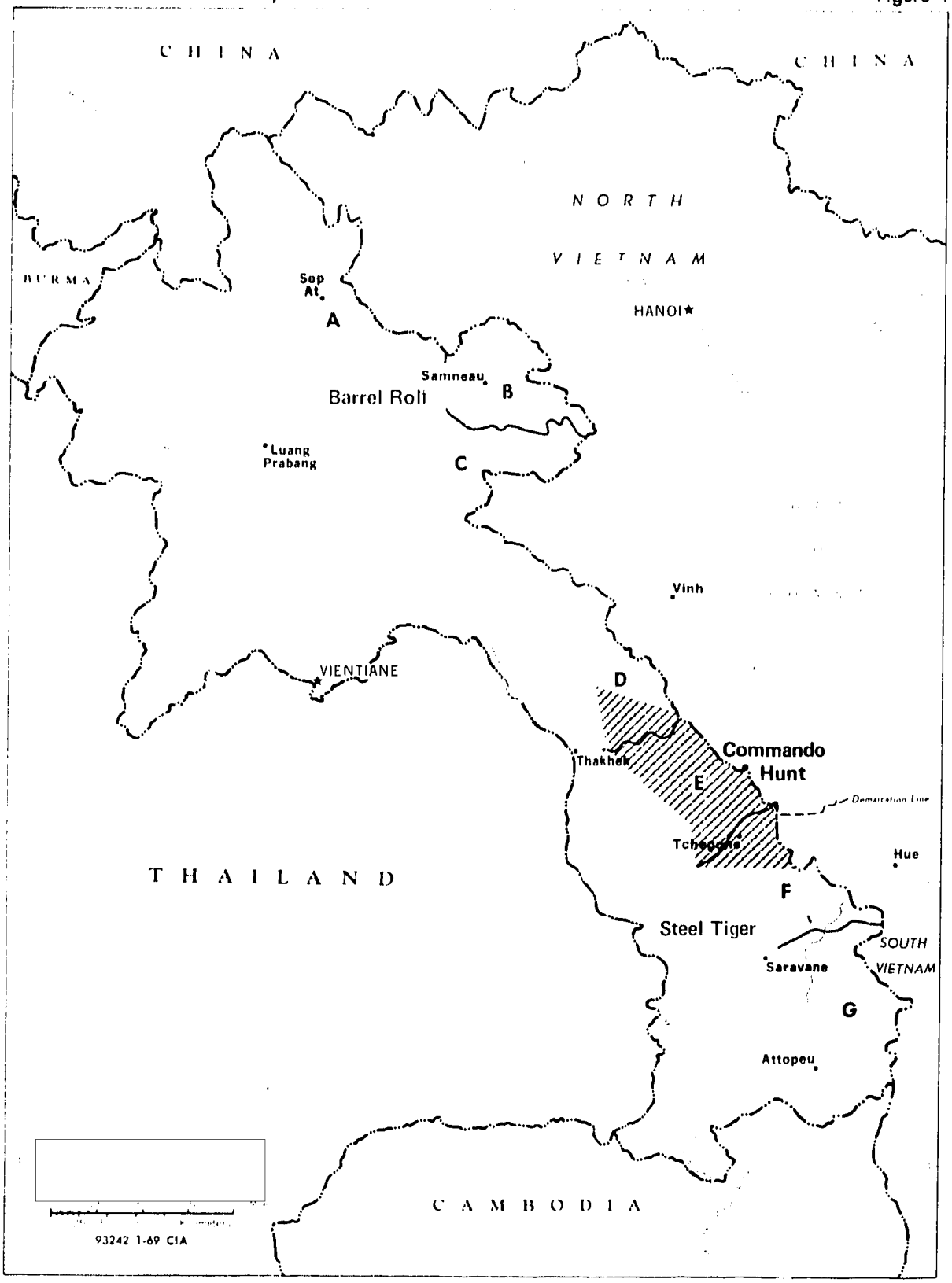
The Target System

6. The primary target system in the Laotian Panhandle is the logistic pipeline through which supplies move, largely by truck, from North Vietnam

* *For a textual delineation of Commando Hunt targets, see the Appendix.*

LAOS: "Barrel Roll", "Steel Tiger", and "Commando Hunt" Operational Areas

Figure 1



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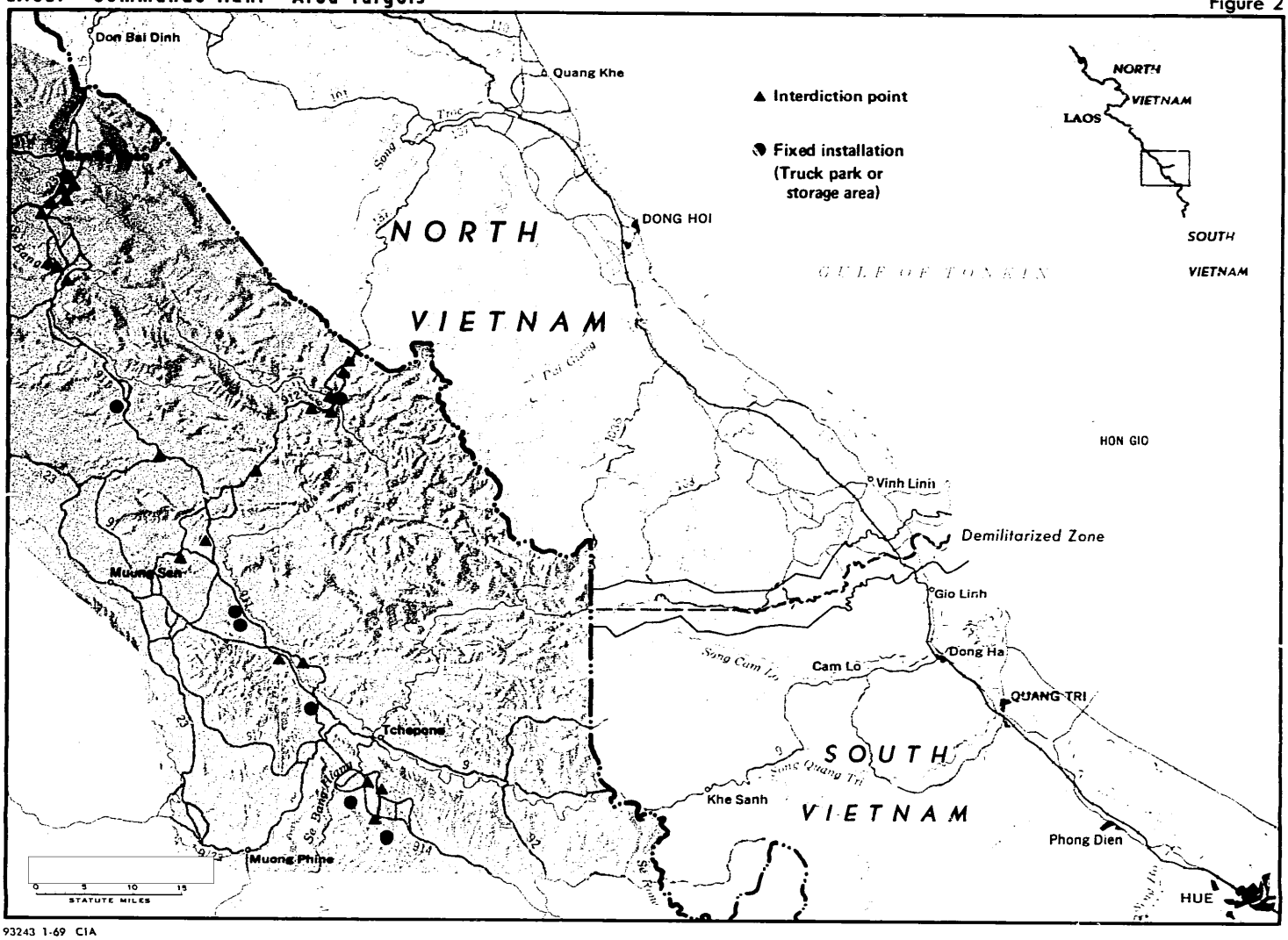
LAOS: "Commando Hunt" Area Targets

Figure 2



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to the Communist forces in Laos and South Vietnam. The target system -- 1,200 miles of roads, over 1,000 trucks, and more than 1,300 small supply complexes, antiaircraft artillery sites, bridges, and other fixed targets -- is relatively invulnerable to permanent damage from air attacks. Many of the targets are hidden under jungle canopy and camouflage, are difficult to identify, and are easily dispersed or relocated. Other targets are fleeting or transitory. Trucks, for example, operate at night or during periods of poor flying weather. They are difficult to attack with high-performance jets; conventional "iron bombs" do not have a large enough lethal radius to be an effective weapon against them.* Large numbers of trucks have been destroyed during the past year in Laos. However, these losses have not seriously impeded the movement of supplies to South Vietnam.

7. The North Vietnamese have established a highly efficient logistical system in the Laotian Panhandle. The primary responsibility for moving supplies in the Panhandle rests with the 559th Transportation Group, a subordinate of the General Directorate of Rear Service and the North Vietnamese Ministry of Defense. The 559th, which was established as long ago as 1959, has headquarters in the Sepone area. It controls seven to ten military stations stretching from the lower Panhandle of North Vietnam

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* *Throughout the war, the lack of specialized munitions for destroying trucks, interdicting roads, and disrupting enemy logistic activity has limited the effectiveness of US air strikes. One of the most effective antitruck weapons in Laos has been the M-36 firebomb dating back to World War II. The A-26, a World War II aircraft, has been one of the most effective aircraft for attacking trucks in Laos. At present, only a handful of A-26's and very small quantities of firebombs remain in the US ordnance inventory. Requests have been made for acceleration of production schedules for improved munitions. For a breakdown of the ordnance delivered in Laos during the period 1965-November 1968, see Table 2.*

to the tri-border area in southern Laos. An estimated 12,000 full-time and 5,000 part-time workers are engaged in moving supplies and constructing and maintaining roads, trails, water routes, and supply bases.

8. North Vietnamese transport battalions moved an estimated average of 165 tons* of supplies per day -- the equivalent of about 55 trucks a day -- into the Laotian Panhandle during 1968, of which 65 tons have been consumed in the Panhandle by North Vietnamese and Pathet Lao troops and construction workers and 100 tons have been available for stockpiling or shipment to South Vietnam.** Considerably more supplies moved into the Laotian Panhandle in 1968 than in 1967, when an average of only 95 tons a day entered the Panhandle and only 55 tons were available for stockpiling in Laos or movement to South Vietnam.

Truck Destruction

9. The number of trucks reported destroyed in Laos has increased since the bombing halt in North Vietnam, but the increase has not been proportionately as great as the increase in attack sorties. As shown in the following tabulation, the number of trucks destroyed and damaged in the Laotian Panhandle during November 1968 was less than half the number destroyed and damaged in November 1967.

Month	Reported Trucks Destroyed and Damaged	Attack Sorties
November 1967	826	3,730
October 1968	193	4,320
November 1968	390	12,160
1-29 December 1968	749	13,360 (Est.)

* *Short tons are used throughout this memorandum.*

** *Excluding losses. Although no precise estimate is possible, the available evidence indicates that normal transit losses and losses from air strikes account for not more than 20 percent of the supplies entering the Laotian Panhandle.*

Thus attack sorties in the Panhandle increased in November 1968 to about three times the daily level of October, but the attacks reportedly destroyed and damaged only three enemy trucks for every 100 sorties, down from four trucks destroyed and damaged per 100 sorties in October and well below the 22 reported in November 1967.* The monsoon season did not end until mid-November, which partly explains the smaller number of trucks destroyed and damaged in 1968. In 1967 the wet season ended in the last week in October. In addition, much more emphasis was given in 1968 to attempting the physical cutting of the main routes into the Laotian Panhandle over extended periods of time rather than concentrating on trucks as had been the case in 1967. Finally, fewer trucks are being offered as prime targets by the Communists. The enemy has learned the importance of moving under cover of darkness and poor flying weather as well as of dispersing traffic movements.

10. Two-thirds of the reported truck losses in Laos since the bombing halt in North Vietnam have occurred on eight routes in the E and F sectors of the Steel Tiger area -- Routes 12, 23 north of 911, 911, 912, 9, 92 south of 9, 914, and 922. Route 911, the only important road linking the major truck entry routes from North Vietnam with the network in the lower Laotian Panhandle and its extensions into South Vietnam, has accounted for half of all reported truck losses in Laos since 1967.

Damage to Fixed Targets

11. The simple nature of most of the available fixed targets in Laos makes it very difficult to judge the damage being done to them. The data do show, as would be expected in view of the increased number of sorties being flown, an increase in the number of occurrences of damage to roads, fords and ford approaches, antiaircraft artillery sites, and supply complexes since the bombing halt in North Vietnam (see Table 4). Reports of damage have more

* *See Table 3.*

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than doubled compared with the monthly average prior to 1 November. It is not certain why damage to fixed targets in G sector increased in November so markedly above the 1968 average, because during November the G sector received only 14 percent of the attack sorties directed against Steel Tiger targets. Better weather in this area may have revealed better targets, or troop redeployments from South Vietnam into base areas in Laos may have resulted in an increasing number of lucrative air strikes. The average monthly number of reports of damage against various targets during the first ten months of 1968 and the November totals against such targets are shown in Table 5.

Effect on Logistical Movements

12. The increased number of air attacks against targets in the Laotian Panhandle since the bombing halt have disrupted traffic movements in the E sector of Steel Tiger; however, data based on pilot sightings, sensor reports, and roadwatch teams indicate that about the same amount of traffic is presently moving into and within the Panhandle as in 1967.

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Numerous "chokepoints," such as Ban Laboy Ford six miles south of the North Vietnamese border on Route 912, have been subject to particularly heavy attack both before and after the November bombing halt.* Some of these targets have been attacked on an around-the-clock basis, and it is probable that as a result of this intensified

* *Information recently available shows that during the period of 1 November-17 December about 10 percent of the attack sorties flown in southern Laos were directed against the Ban Laboy Ford areas on Route 912-B, and 11 percent were flown against the Ban Pha Nop interdiction points in the Route 23-A complex.*

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bombing, fewer trucks moved into Laos over Route 912 in 1968 than in 1967. Nevertheless, traffic has continued to flow through even the most heavily bombed Ban Laboy chokepoint. Although photography shows that the main ford at Ban Laboy on Route 912 has been temporarily abandoned, new crossings have been constructed. Furthermore, sensor detections of vehicles on Route 912 increased to 250 during 4-24 December, compared with an average of 125 per week in November. At least four engineer battalions, some 2,200 men, have quickly repaired bomb damage, built a two-mile bypass road through the higher terrain northeast of the ford, and constructed a decoy pontoon bridge and other spurious facilities.

14. Throughout the remainder of the Panhandle, enemy countermeasures, underway for years, have been able to negate much of the damage inflicted on the Laotian logistic system. As in North Vietnam, construction crews have steadily reduced the vulnerability of the roadnet by straightening curves, reducing steep grades, constructing multiple bypasses, and erecting decoy facilities. Damage to important targets has been repaired quickly.

15. The conclusion that the air attacks in the Laotian Panhandle have not crippled or seriously impeded traffic is supported by pilot sightings that have increased significantly in recent weeks. Sightings in November 1968 increased over sightings in October by about the same percentage as in 1967. Furthermore, the absolute number of sightings in October, November, and December of 1968, compared with the comparable period in 1967 was remarkably close, as shown below:

	Weekly Pilot Truck Sightings in the Steel Tiger Area			
	1967	Percent Increase	1968	Percent Increase
October	248	--	235	--
November	1,062	328	1,026	337
December	1,365	29	1,243	21

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16. Other indications of continued, and recent increases, of truck movement in the Panhandle are sensor reports revealing that vehicles continued to move along the major roads of the Igloo White area in large numbers during November. Sensor reports of moving vehicles in Laos for recent weeks are given in the tabulation below:

Week	Daily Average
16-22 October	59
23-29 October	32
30 October-5 November	104
6-12 November	72
13-19 November	283
20-26 November	266
27 November-3 December	230
4-10 December	246
11-17 December	312
18-24 December	382
25-31 December	665

17. Photography shows that several key interdiction points on the roads south of Mu Gia Pass were heavily hit [redacted] This route may have been completely interdicted for a portion of this period, but sightings of trucks by pilots on key road segments at this time were double the average sightings in November. In addition, the number of trucks moving south through Mu Gia Pass into the Laotian Panhandle has been about normal for this time of year as shown in the following tabulation:

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	Average Number of Trucks per Day	
	1967	1968
October	17	19
November	10	11
December	20	21

Roadwatch teams report normal amounts of traffic moving through the remainder of the Panhandle.

Changes in Air Defense

18. The air defense capability in the Laotian Panhandle has increased appreciably since late October. Air defenses in Laos still rely primarily on 37-mm antiaircraft artillery, the basic antiaircraft weapon in North Vietnam, but an increase in large-caliber guns as well as smaller caliber automatic weapons has recently been noted. Several 85-mm guns, the largest currently observed in Laos, were first noted in late October in the lower half of Echo sector in the vicinity of Route 912. In November, two possible fire-control radars (Fire Can) were first reported a short distance west of Mu Gia Pass. These radars can be used with either 57-mm or 85-mm weapons, both of which are known to be located well within the envelope of these Fire Cans. The North Vietnamese have not yet deployed any SAM defenses to Laos.

19. At least five Pathet Lao and two North Vietnamese antiaircraft artillery battalions were located in the Laotian Panhandle in late October, and a third North Vietnamese battalion may have been in the area. In late November the [redacted] Antiaircraft Artillery Battalion deployed from North Vietnam to the heavily attacked Ban Laboy area to replace the [redacted] Antiaircraft Artillery Battalion, which moved about 10 to 15 miles south to the area occupied by the North Vietnamese [redacted] Antiaircraft Artillery Battalion. At least 300 to 500 guns probably are deployed with the eight or nine

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battalions.

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20. Combat losses generally have been low in the air war over Laos; during 1968 (through November), only 32 fixed-wing aircraft were downed in Laos by Communist defenses, and the combat loss rate has been about 0.5 aircraft per 1,000 sorties. The comparable loss rate in North Vietnam during 1968 (through October) was 1.1 aircraft per 1,000 sorties. Despite the apparent increase in enemy defenses, only four aircraft were lost over Laos during November, a loss rate similar to that in prior periods. Three of the losses were caused by operational failures, and one support aircraft was downed by enemy fire. The North Vietnamese have the capability to greatly augment their antiaircraft artillery air order of battle in Laos with more weapons and experienced crews from the areas now freed of bombing. Furthermore, even though the US loss rate remains low, the increased number of enemy antiaircraft weapons in Laos lessens the effectiveness of US air operations. FAC aircraft become more susceptible to antiaircraft fire and must curtail some of their low-level flying; the accuracy of bombing runs is reduced; and more sorties have to be allocated to suppression of anti-aircraft artillery fire.

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Table 1

The Air War over Laos and North Vietnam
1965 - October 1968

	Laos	North Vietnam
Attack sorties	155,440	307,190
Attack sorties by B-52 aircraft	3,740	2,275
Ordnance (short tons)	367,990	636,740
Ordnance per attack sortie (short tons)	2.4	2.1
Combat losses of attack aircraft	127	719
Combat losses of attack aircraft per 1,000 attack sorties	0.8	2.3

Table 2

Ordnance Delivered in Laos a/
1965 - November 1968

	Short Tons			
	1965	1966	1967	1968
January-March	N.A.	33,780	39,270	52,830
April-June	N.A.	20,930	30,890	52,710
July-September	N.A.	5,020	15,940	26,350
October-December	N.A.	13,940	41,930	59,000 b/
Total	*18,500*	*73,680*	*128,020*	*190,890* c/

a. Totals include expenditures by B-52 aircraft. Because of rounding, components may not add to the totals shown. Data for ordnance delivered during 1965 and during November 1968 are estimated.
b. October-November.
c. January-November.

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Table 3

Attack Sorties Compared with Trucks Reported Destroyed and Damaged in the Steel Tiger Area January-November 1967 and 1968

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	1967			1968		
	October	November	January-November	October	November	January-November
Average number of trucks destroyed and damaged per day a/	2.3	27.5	8.2	6.2	13.0	19.5
Average number of attack sorties per day b/	75.3	124.3	103.5	139.4	405.3	159.7
Average number of trucks destroyed and damaged per 100 attack sorties	3.1	22.1	7.9	4.4	3.2	12.2

a. DIA source for information.
b. Including B-52 attack sorties.

Table 4

Targets Destroyed and Damaged
in the Steel Tiger Area a/
1967 - November 1968

	1967	1968	
	January-December Monthly Average	January-October Monthly Average	November
Transportation targets other than trucks			
Truck parks	177	92	299
Road segments	350	303	494
Fords/ford approaches	35	29	73
Bridges/bridge approaches	29	14	14
Watercraft	16	8	15
Ferries/ferry facilities	9	Negl.	3
Military targets			
AAA/AW sites	80	98	139
Bunkers	16	25	95
Structures	86	75	117
Bivouac areas	3	3	22
Supply areas/military complex	138	108	288
POL storage areas	2	9	1

a. *Excluding trucks.*

Table 5

Targets Destroyed and Damaged in the Steel Tiger Area a/
January-November 1968

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	Sector									
	D		E		F		G		All Sectors	
	Nov	Monthly Average Jan-Oct	Nov	Monthly Average Jan-Oct	Nov	Monthly Average Jan-Oct	Nov	Monthly Average Jan-Oct	Nov	Monthly Average Jan-Oct
Truck parks	1	0	154	50	87	27	57	15	299	92
Road segments	11	0	184	108	118	111	181	84	494	303
AAA/AW sites	1	0	67	40	37	41	34	17	139	98
Supply areas/ military complexes	2	1	92	36	77	48	117	23	288	108
Total	*15*	*1*	*497*	*234*	*319*	*227*	*389*	*139*	*1,220*	*601*
Percent of total sectors	1	0	41	39	26	38	32	23	100	100

a. Excluding trucks.

APPENDIX

Commando Hunt Targets

Commando Hunt is a program for conducting an intensified interdiction campaign in Laos during the 1968-69 northeast monsoon season. Its general purpose is to reduce the flow of enemy supplies into South Vietnam by destroying and damaging trucks, supply caches, and fixed targets and, concomitantly, to determine the effectiveness of the Igloo White sensor program. Commando Hunt employs an improved command and control system, new munitions, and increased forces in an area extending from the Mu Gia Pass to about six miles south of Sepone, embracing 1,700 square miles and including 450 miles of primary roads. The 30 targets posited in the plan are given below and are differentiated by type in Figure 2.

Route/Area	Number of Targets in Area
Between Route 15 (NVN) and the junction of Routes 23 and 911 (Laos)	9
Route 911, north of Route 912, to Route 23	2
Route 912	7
Route 911, south from Route 912, and bypasses, to Route 91	4
Route 91, south of Route 911, to Route 914	3
Route 914	5